Analysis of Brownfields Cleanup Alternatives: Former Livingston Memorial Hospital 504 South 13th Street, Livingston, Montana

Tetra Tech Project No. 117-8292002
August 16, 2018

PRESENTED TO

Central Montana Brownfields Coalition
c/o Snowy Mountain Development Corp
613 N.E. Main
Lewistown, MT 59457

PRESENTED BY

Tetra Tech
825 West Custer Ave
Helena, MT 59602

P +1-406-443-5210
F +1-406-442-7182
tetratech.com

Prepared by:

8/16/18

Nicholas Sovner — Date
Tetra Tech Project Manager

Reviewed by:

8/16/18

Jerold A. Armstrong, L.G. — Date
Tetra Tech QA Officer

Reviewed by:

8/16/2018

Karen Sweeney — Date
SMDC Program Manager

TABLE OF CONTENTS

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ABCA	Analysis of Brownfields Cleanup Alternatives
ACBM	Asbestos Containing Building Materials
AHERA	Asbestos Hazard Emergency Response Act
CMBC	Central Montana Brownfields Coalition
CRP	Community Relations Plan
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
LBP	Lead Based Paint
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIH	Northern Industrial Hygiene
NIOSH	National Institute for Occupational Safety and Health
RACM	Regulated Asbestos Containing Material
REC	Recognized Environmental Condition
SMDC	Snowy Mountain Development Corporation
QEP	Qualified Environmental Professional

1.0 INTRODUCTION AND BACKGROUND

This document presents an Analysis of Brownfields Cleanup Alternatives (ABCA) for the Former Livingston Memorial Hospital located in Livingston, Montana (the Site). This document was prepared for the Central Montana Brownfields Coalition (CBMC) Revolving Loan Fund program as part of the U.S. Environmental Protection Agency (EPA) Brownfields Cleanup Grant Application in conjunction with the Community Relations Plan (CRP) being submitted by Snowy Mountain Development Corporation (SMDC).

1.1 SITE LOCATION AND OWNERSHIP

The Site is located at 504 South 13th Street in Livingston, Park County, Montana. The legal description is: Park Addition, Section 24, Township 2 South, Range 9 East, All of Block 29. The Site is currently owned by Montana Homeownership Network, Inc. dba NeighborWorks Montana.

1.2 PREVIOUS SITE USES

The Site building was constructed in 1950 and began operating as the Livingston Memorial Hospital in 1955. Additions to the building were constructed in 1987 and 1989, while two outbuildings were constructed in 1960 and 2004. The parcel that the Site occupies is approximately 2.5-acres and the main hospital building is 27,700-square feet. Historically the Site has always been used as a hospital until 2015 when all medical facilities were relocated to a new location east of town. In 2017, after conducting community outreach activities, NeighborWorks Montana purchased the property from a developer to redevelop the Site as affordable housing apartment units. On April 16, 2018, the building was placed on the National Register of Historical Places. To date no cleanup of contaminated building materials has been completed.

1.3 SITE ASSESSMENT FINDINGS

The following presents a timeline of assessment work that has been completed to date:

2016: A NESHAP [National Emission Standards for Hazardous Air Pollutants] Asbestos Renovation Survey was conducted by Northern Industrial Hygiene, Inc. (NIH) at the Site on behalf of A&E, LLC (the former property owner). Regulated asbestos containing material (RACM) and Category I and II asbestos containing building materials (ACBM) were identified including: paper and magnesia debris in crawlspaces, vinyl sheet flooring under carpeting, 12-inch x 12-inch floor tile and mastic, 9-inch x 9-inch floor tile and mastic, 4-inch x 24-inch floor tile and mastic, transite wall board (assumed), window calk and glazing, undersink coating, boiler room mudded fittings, pipe insulation, and in roof drain bowl insulation (NIH, 2016).

2017: A Phase I Environmental Site Assessment (ESA) was completed by GEM Environmental, Inc. (GEM) for the Site on behalf of Homeword, Inc. (a community partner). This ESA identified one historical recognized environmental condition (REC), two RECs, and five potential issues of concern associated with the Site.

- The historical REC includes a 2,500-gallon underground storage tank associated with an emergency generator in operation from 1990 through 2015. While no evidence of a leak was detected during permitted tank removal activities, some of the piping associated with the system was left in place due to the presence of a natural gas line limiting access.
- The first REC is a site sump located in the basement mechanical room because the outflow and past uses are unknown. The second REC is the presence of ACBM that was identified in the 2016 NESHAP Asbestos Renovation Survey.

- Issues of concern for the Site include a vapor inhalation risk due to past use of petroleum products onsite, the likelihood that lead based paint (LBP) and mercury switches in addition to ACBM is present but has not been surveyed, and that several dry and liquid chemicals were being stored onsite.

Based on the findings presented above, GEM recommended that a Phase II ESA be completed to evaluate the presence or non-presence of LBP and mercury switches and re-evaluate the vapor inhalation risk at the Site from the basement sump and storage tank (GEM, 2017).

2018: In April 2018 as part of an EPA Targeted Brownfields Assessment of the Site, Weston Solutions, Inc. (Weston) completed a Phase I ESA at the Site. Weston did not concur with the findings in the 2017 ESA prepared by GEM with regards to the historical REC, the vapor inhalation risk, or the potential contamination a result of the sump. Weston identified the ACBM as a REC, and also recommended that a Phase II ESA be completed to evaluate the presence of LBP additional ACBM, and mercury switches at the Site (Weston, 2018a).

In May 2018 Weston completed a Phase II ESA at the Site. Additional sampling for ACBM identified asbestos in the incinerator transite flue and pipe gaskets. Dust wipe samples were collected throughout the building and identified chrysotile and amosite on numerous surfaces. Over 900 x-ray florescence readings were collected to evaluate for the presence of LBP, and 86 of those readings were positive for LBP. Lead in soil was analyzed around the structure but laboratory analytical results were all less than the Montana Department of Environmental Quality (DEQ) action level of 153 milligrams per kilogram. A 0.5-gallon container of transformer oil was observed inside the basement and was believed to contain polychlorinated biphenyls, as well as seven mercury thermostat switches throughout the building. Recommendations in the report included contracting with an accredited asbestos remediation company to determine appropriate remedial actions for ACBM and asbestos dust on surfaces. In addition, lead sheet metal, lead lined doors, and leaded glass that were identified should be properly disposed or recycled during renovation activities (Weston, 2018b).

1.4 PROJECT GOAL

The planned reuse goal for the Site is to provide affordable housing for the residents of Livingston. Homeward, Inc. conducted several outreach measures and solicited support for this project from the City of Livingston and Park County. The results of an outreach survey identified that home prices have risen by up to 30 percent since 2014, and that many businesses are being impacted by the lack of affordable housing. Livingston is near Yellowstone National Park and many homes are currently being rented on internet sites such as Air B and B and VRBO, hence the need is imminent.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 CLEANUP OVERSIGHT RESPONSIBILITY

Tetra Tech has been hired by SMDC to provide qualified environmental professional (QEP) services for this project. Tetra Tech's scope of work consists of preparing brownfields related documents including this ABCA, preparing the ACM and LBP design plan, bid package preparation, contracting assistance, and asbestos abatement surveillance and clearance monitoring services. Clearance and monitoring services will include the collection of air samples during all abatement activities to document any release of airborne asbestos, if it occurs; completion of post-abatement final visual inspections, clearance air monitoring, sample analysis, and report preparation.

2.2 CLEANUP STANDARDS FOR MAJOR CONTAMINANTS

2.2.1 Asbestos

The Asbestos Hazard Emergency Response Act (AHERA) requires that 13 Transmission Electron Microscopy air samples to be collected on all friable asbestos removal projects over 160-square feet or 260-linear feet, and phase contrast microscopy samples on non-friable projects or friable projects under 160-square feet or 260-linear feet. The onsite analyses for building materials includes the National Institute for Occupational Safety and Health (NIOSH) Method 7400 for asbestos fiber counting. The DEQ Asbestos Control Program requires that five samples in a single containment to be below 0.01 fibers per cubic centimeter in buildings for clearance purposes.

2.2.2 Lead

LBP is defined as surface coatings with a lead concentration greater than or equal to 1.0-milligrams per square centimeter or 0.5 percent by weight (40 Code of Federal Regulations [CFR] Part 745). Deteriorated LBP can cause elevated lead levels in dust and exposure risks to building occupants. For disposal purposes, under 40 CFR 261.24, lead hazardous waste is defined as products that have test results above 0.5 milligrams per liter of lead in samples submitted to a laboratory for the toxicity characteristic leaching procedure extract procedure.

2.3 LAWS AND REGULATIONS APPLICABLE TO CLEANUP

2.3.1 Asbestos

As delegated by EPA and the Asbestos Control Act of Montana, DEQ administers regulatory requirements from sections of the NESHAP and Montana Administrative Rules, governing building renovations/demolitions, asbestos disposal and other asbestos-related activities. Asbestos is defined as a group of naturally occurring fibrous minerals including chrysotile, amosite, crocidolite, anthophyllite, actinolite and tremolite that presents a potential exposure and health hazard. The following list presents the federal regulations regarding the removal and disposal of ACBM enforced by DEQ:

- 29 CFR 1926.1101 - Asbestos; Construction Industry Standard; Final Rule, August 24, 2006.
- 29 CFR 1910.1001, Asbestos; General Industry Standard; Final Rule, August 24, 2006.
- 40 CFR 763, Asbestos; Asbestos-Containing Materials in Schools; Final Rule, November 12, 1987.
- 40 CFR 61(M) - National Emission Standard for Asbestos; Final Rule, November 20, 1990, revised June 19, 1995.

2.3.2 Lead

The followings items represent the list of regulations associated with the sampling and handling of LBP:

- 40 CFR 745, Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child Occupied Facilities; Final Rule, August 29, 1996, revised January 5, 2001.
- 24 CFR 35 & 40.745, Lead; Requirements for Disclosure of Know Lead-Based Paint and/or Lead-Based Paint Hazards in Housing; Final Rule, March 6, 1996.
- 40 CFR 40.260, Hazardous Waste Management System; General; Final Rule, July 1, 2012.
- 40 CFR 40.261, Identification and Listing of Hazardous Waste; Final Rule, July 1, 2012.
- 40 CFR 40.262, Standards Applicable to Generators of Hazardous Waste; Final Rule, July 1, 2012.
- 40 CFR 40.263, Standards Applicable to Transporters of Hazardous Waste; Final Rule, July 1, 2012.
- 40 CFR 40.264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Final Rule, July 1, 2012.
- 40 CFR 40.265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Final Rule, July 1, 2012.

- 40 CFR 40.268, Land Disposal Restrictions; Final Rule, July 1, 2012.
- 29 CFR 29.1926.62, Occupational Health and Environmental Controls, Final Rule May 4, 1993, revised March 26, 2012
- Housing and Community Development Act, Residential Lead-Based Paint Hazard Reduction Act, Title X, 1992.
- Housing and Urban Development, Guidelines for the Control of Lead-Based Paint Hazards in Housing, June 1995, revised 1997 and 2000.

Worker exposure to lead hazards in construction is regulated under 29 CFR 1926.62. OSHA has established provisions for worker protection including, but not limited to training and medical monitoring requirements for personnel engaging in the oversight and removal of LBP, exposure limits, respiratory protection, personnel protective equipment, work practices, engineering controls, and storage of wastes.

The handling storage, transport, and disposal of lead or lead-contaminated waste must be conducted in accordance with 40 CFR 260-265, and building owners must comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

3.1 CLEANUP ALTERNATIVES CONSIDERED

To address impacts to the Site from ACBM and LBP, four alternatives were considered including:

1. No Action: The no action alternative would be to do nothing at the Site and leave known quantities of ACBM and LBP in place indefinitely.
2. Delayed Abatement: The delayed abatement alternative would be to leave ACBM and LBP in place temporarily with the intention of performing abatement at a later date.
3. Partial Abatement: The partial abatement alternative would include removing and disposing of some ACBM and LBP and the exact quantities would be dependent on remodeling plans to determine which areas would be disturbed.
4. Full Abatement: The full abatement alternative includes removal and disposal of all ACBM and LBP for full renovation of the Site.

3.2 COST ESTIMATE OF CLEANUP ALTERNATIVES

The following sections evaluates the effectiveness, implementability, and preliminary costs of each option.

3.2.1 Effectiveness

1. No Action: No action is not effective in controlling or preventing exposure of receptors to ACBM and LBP at the Site.
2. Delayed Abatement: In the short term delayed abatement would also not be protective from exposure to ACBM and LBP, and the future renovation design plans would determine the extent of abatement at a later date.
3. Partial Abatement: The partial abatement alternative may be very effective at preventing exposure to ACBM and LBP, but the underlying materials not removed and disposed of could potentially pose a risk in the future if additional renovation or repair work is needed in those areas not addressed.
4. Full Abatement: The full abatement alternative would be the most effective option for preventing exposure to ACBM and LBP at the Site. All regulated materials would be removed from the Site and properly disposed of negating the need for an Asbestos Control Plan for the Site.

3.2.2 Implementability

1. No Action: No Action is easy to implement since no actions will be conducted.
2. Delayed Abatement: Delayed abatement in the short term is easy to implement because no immediate action is required, however future actions would require the same level of effort as the partial or full abatement alternatives.
3. Partial Abatement: The partial abatement alternative requires the same level of effort to implement as full abatement because the same project stakeholders, brownfields grantee, and QEP need to be involved to ensure the project is successful. A benefit to partial abatement would be that cleanup would occur more quickly as the abatement firm would have less work to do before asbestos clearance samples could be collected by the QEP.
4. Full Abatement: The full abatement alternative requires the same level of effort to implement as the partial abatement alternative. Full abatement will also take the most amount of time to complete as every regulated building material will have to be removed before asbestos clearance samples can be collected.

3.2.3 Cost

1. No Action: There are no costs to implement this alternative, but the cost of maintaining the vacant hospital building is high. It costs approximately $55,000 per year to maintain the vacant building because it is not safe for human occupancy. These costs include insurance, maintenance, utilities, and security until the building is fit for long term occupancy.
2. Delayed Abatement: Short term costs for this alternative includes the $55,000 per year until abatement can occur, plus the cost of abatement at a later date which will be dependent on what level of cleanup is chosen.
3. Partial Abatement: The minimum cost anticipated for partial abatement is approximately $225,000 which includes both QEP and abatement contractor services. Partial abatement is less cost efficient than full abatement because mobilization dollar amounts for the QEP and abatement contractor would be roughly the same in both instances.
4. Full Abatement: The cost of full abatement is anticipated to be approximately $320,000 which includes QEP and abatement contracted services.

3.2.4 Climate Change

Per EPA's How to Address Changing Climate Concerns in an ABCA memo (EPA, 2014), this section will cover how climate change affects each alternative. According to the National Oceanic and Atmospheric Administration, Montana's average annual temperature has increased approximately 2 degrees Fahrenheit since the early 20th century as evidenced in winter time where there are fewer very cold days since 1990. Projected increases in spring precipitation will have negative impacts for residents in flood prone areas as the frequency of severe flood events increases. The frequency of wildfire occurrence and severity is also projected to increase throughout Montana (https://statesummaries.ncics.org/mt#).

The direct impacts of climate change for the residents of Livingston related to housing relocation due to increased wildfires along the urban-wildland interface and those living near the 100-year flood plain elevation. Sea level rise in coastal communities will have an indirect impact on the City of Livingston because US citizens living near the ocean in more populous states may choose to relocate to inland cities further affecting this community which is already managing an inflated housing market due to its proximity to the National Park. For these reasons it is an imminent need that either alternative of No. 3 or 4 is chosen for the Site to be utilized as affordable housing.

RECOMMENDED CLEANUP ALTERNATIVE

The recommended cleanup alternative is No. 4, full abatement. Full abatement provides the greatest reduction in exposure to ACBM and LBP, requires a similar level of effort as options No. 2 and 3, and provides the greatest cost efficiency by minimizing documentation and mobilization costs during and after cleanup. Furthermore, the Site will be free from an Asbestos Control Plan and can be redeveloped for affordable housing which is a direct benefit to community.

4.0 REFERENCES

GEM Environmental, Inc., 2017. Phase I Environmental Site Assessment; Former Livingston Memorial Hospital. Prepared for Homeword, Inc. May 30.

Northern Industrial Hygiene, Inc. (NIH), 2016. NESHAP Asbestos Renovation Survey: Former Livingston Hospital. Prepared for A&E, LLC. March 7.

U.S. Environmental Protection Agency, EPA, 2014. How to Address Changing Climate Concerns in an Analysis of Brownfield Cleanup Alternatives (ABCA). April. Document No. EPA 560-Q-14-001.

Weston Solutions, Inc., 2018a. Phase I Environmental Site Assessment for Livingston Memorial Hospital. Prepared for U.S. Environmental Protection Agency. April. Document Control No. W0572.1A.01567.

Weston Solutions, Inc., 2018b. Phase II Environmental Site Assessment for Livingston Memorial Hospital. Prepared for U.S. Environmental Protection Agency. May 25. Document Control No. W0572.1A.01619.